PRESS KIT

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546
TELS. WO 2-4155
WO 3-6925

FOR RELEASE: FRIDAY PM'S
June 25, 1965

RELEASE NO: 65-202

PROJECT: APOLLO PAD-ABORT

CONTENTS

Launch is scheduled no earlier than June 29, 1965.

NEWS NASA

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

TELS. WO 2-4155
WO 3-6925

FOR RELEASE: FRIDAY PM'S
June 25, 1965

RELEASE NO: 65-202

NASA SCHEDULES PAD-ABORT TEST FOR APOLLO SPACECRAFT

The National Aeronautics and Space Administration will conduct an off-the-pad abort test with a dummy Apollo command module at White Sands Missile Range no earlier than June 29.

It is the fifth in a series of Apollo launch escape tests. The test will simulate an abort from ground level, using the Apollo launch escape system for propulsion. This type of escape would be necessary in an actual mission if serious trouble developed with the Saturn launch vehicle just before or during ignition of the engines.

A similar test was conducted in November, 1963, at White Sands. But since that test, the Apollo command module has been equipped with a boost protective cover and canard subsystem.

- more - 6/21/65

The cover protects the spacecraft windows from soot generated by the escape systems' motors and is jettisoned with the launch escape system. The canards are wing-like devices near the top of the escape rocket to provide aerodynamic stability of the spacecraft at low altitudes before parachute deployment.

The Apollo spacecraft command module used for this test is designated boilerplate 23A. It was flown last December aboard a Little Joe II launch vehicle at White Sands in a test which simulated an abort at the point of maximum aerodynamic pressures. It is the first Apollo boilerplate to be used a second time for flight testing.

FLIGHT PLAN

Launch will be from a special adapter at Launch Complex 36 of the White Sands Missile Range. It will be powered by the launch escape rocket's 155,000 pounds of thrust.

The launch escape vehicle (LEV), consisting of the boilerplate command module and its launch escape system, will travel nearly 5,000 feet above the range, or to an altitude of about 9,000 feet mean sea level. (The range is 4,036 feet above sea level at Complex 36.)

Eleven seconds after ignition is signaled from the block-house, wing-like control surfaces, called canards, will deploy near the top of the escape motor, causing the spacecraft to pitch to a blunt-end-forward position.

Three seconds later, the tower jettison motor will ignite, removing the tower and boost protective cover from the space-craft. The forward (apex) heat shield is jettisoned 0.4 seconds later to uncover the parachute containers mounted on the "upper deck" of the spacecraft.

Dual drogue parachutes are deployed by mortars from the upper deck two seconds after the LES is jettisoned. They slow the spacecraft's descent, then disreef to stabilize the module in a blunt-end-forward position.

When the drogue parachutes are jettisoned, three pilot chutes are deployed to extract the three main parachutes from their containers. The main parachutes are deployed in reefed condition, then disreefed to lower the spacecraft to a gentle landing about one mile from the launch site.

The entire flight sequence takes about one minute, 30 seconds.

The following is a sequence of events:

Zero	Ignition	Launch at Complex 36 (4,036 feet MSL)
T plus 11	Canards Deploy	8,300 feet MSL
T plus 14	Tower and Boost Protective Cover Jettison	8,700 feet MSL
T plus 16	Drogues Deploy	8,850 feet MSL
T plus 24	Drogues Disreef	8,100 feet MSL
T plus 28	Pilots Deploy, Pull Main Parachutes from Deployment Bags	7,400 feet MSL
T plus 38	Main Chutes Disreef	5,750 feet MSL
T plus 90	Impact	4,000 feet MSL (Ground Level) one mile north of complex 36.

TEST VEHICLE COMPONENTS

COMMAND MODULE

Boilerplate 23A is a flightweight model of an Apollo command module. It is 11 feet 3 inches high, and 12 feet 10 inches in diameter at its base. Shaped like a cone, its main (aft) heat shield covers the blunt end to protect it at impact. It weighs about 11,000 pounds.

Forward Heat Shield: The forward (apex) heat shield is a small conical shell which covers the upper third of the spacecraft, enclosing the parachutes, egress hatch and other equipment mounted around the upper deck. The forward heat shield is jettisoned by four thrusters, powered by two gas generators, 0.4 seconds after the LES is jettisoned.

Aft (Main) Heat Shield: The aft heat shield protects the command module from damage during Earth landing. For this mission, no protection from aerodynamic reentry heating is required. It is made of inner and outer skins of laminated glass cloth over an aluminum honeycomb core.

Boost Protective Cover: The command module exterior surface is enveloped by a boost protective cover which provides protection from aerodynamic heating during boosted flight and from heat and soot generated by the launch escape and jettison motors. It is made of ablative cork and Teflon-impregnated glass cloth, supported by glass honeycomb in the upper third portion.

EARTH LANDING SUBSYSTEM

The Earth Landing Subsystem (ELS) consists of pyrotechnic-actuated devices; two conical-ribbon drogue parachutes with redundant reefing; three pilot parachutes; three open-ring, ring sail main parachutes with redundant reefing; deployment bags, bridles, risers and an ELS sequencer.

The drogue chutes, 13.7 feet in diameter, are deployed by mortars and are reefed for eight seconds after deployment. The pilot parachutes, 7.2 feet in diameter, extract the main chutes from deployment bags. The main parachutes, 83.5 feet in diameter, remain reefed for eight seconds after deployment. The pilot parachutes, 7.2 feet in diameter, extract the main chutes from deployment bags.

LAUNCH ESCAPE SUBSYSTEM

This system consists of a tower structure, launch escape, pitch control and tower jettison rocket motors, canard subsystem, Q-ball assembly and ballast.

Tower Structure: The tubular framework which connects the spacecraft with the launch escape motor is about 10 feet long and 40 by 50 inches wide at the base. It is attached to the command module by four explosive bolts.

Launch Escape Motor: The launch escape motor is a solid propellant rocket motor, 26 inches in diameter and 15 feet three inches long. It weighs about 4,800 pounds and provides thrust of 155,000 pounds.

Pitch Control Motor: The pitch control motor is a solid propellant rocket motor, nine inches in diameter and twenty-two inches long. It provides a lateral force to pitch the spacecraft downward during the initial phase of the abort mission.

Tower Jettison Motor: This solid propellant motor is 26 inches in diameter and 47 inches long. It develops 33,000 pounds of thrust and is used to separate the LES from the spacecraft after launch escape motor burnout.

Canard Subsystem: Canards are wing-like devices which act as elevators for pitch control at lower altitudes. They stabilize the spacecraft to a blunt-end-forward position just before tower jettison. They are housed inside the LES, between the Q-ball assembly and forward end of the jettison motor. A sequencer actuates the canards 11 seconds after LES ignition, using pyro-actuated, gas generated pistons.

Q-Ball Assembly: This assembly is an airflow sensor at the forward end of the LES. It weighs about 23 pounds and is used to measure differential dynamic pressures. These pressures are part of the information telemetered to the ground during the flight.

INSTRUMENTATION

An onboard tape recorder, using 14-track magnetic tape, will record flight data from the telemetry subsystem. The TM subsystem includes an FM transmitter, a TM modulation package with 13 subcarrier oscillators, three composite signal amplifiers, and a commutator. They operate through four antennae near the forward heat shield, and transmit 94 measurements.

Two cameras are also installed in the launch escape vehicle. One is mounted in the launch excape tower to view downward through the launch escape motor plumes; the other is mounted inside the command module egress tunnel to view upward the separation of launch escape tower and boost protective cover through a special window in the apex heat shield. The second camera also records the deployment of parachutes.

LAUNCH PAD ADAPTER

The launch pad adapter, simulating the connection between the Apollo command and service modules before liftoff, is made of welded tubular steel. The base of the hexagonal adapter is 100 inches along each side at the bottom, and 77 inches along each side at the top. It is four feet high.

CONTRACTOR PARTICIPATION

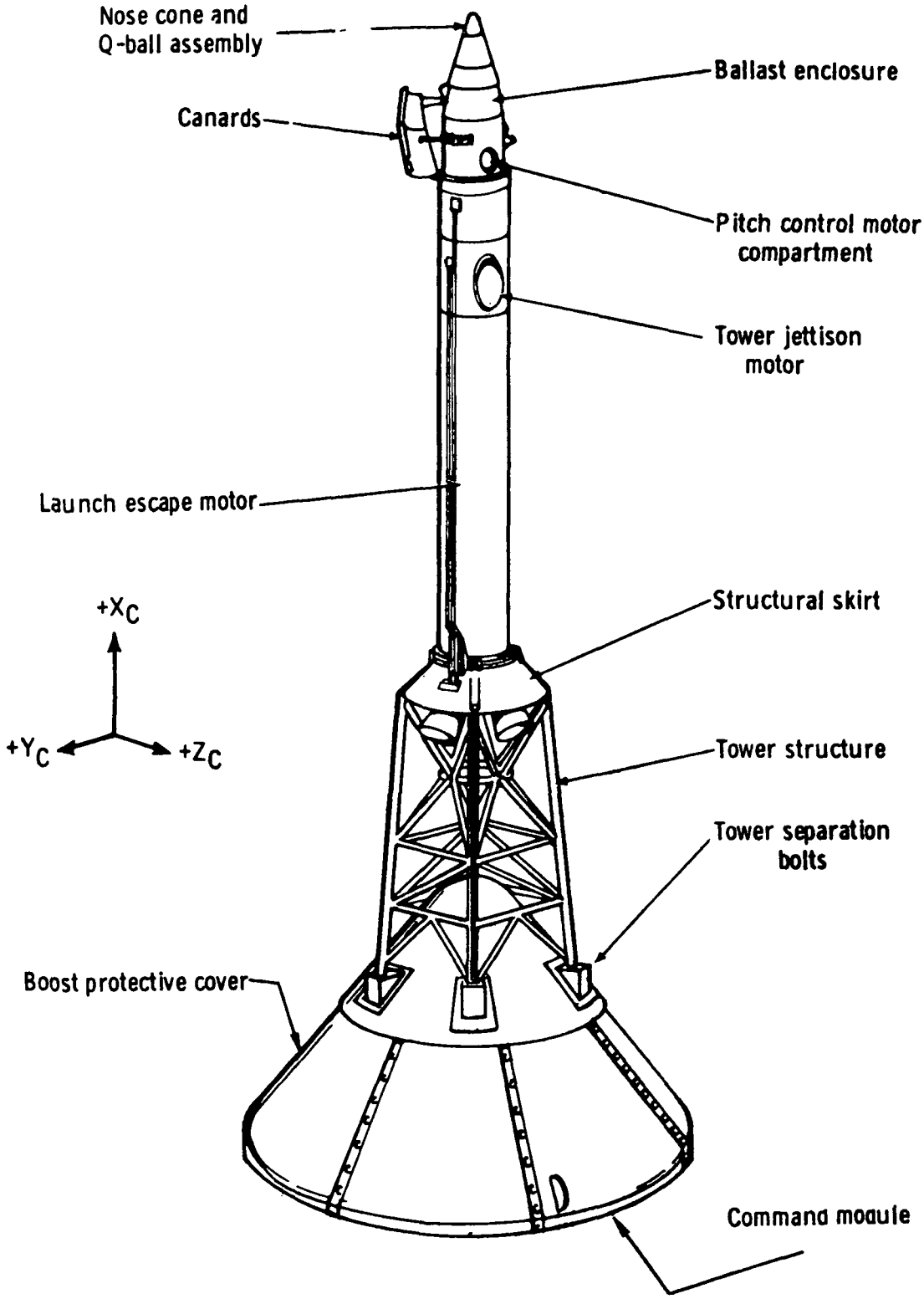
North American Aviation, Inc., Space and Information Systems Division, Downey, Calif., prime contractor for spacecraft command module.

Lockheed Propulsion Co., Redlands, Calif., launch escape and pitch control motors.

Thiokol Chemical Corp., Elkton, Md., LES jettison motor.

Northrop Ventura Division, Newbury Park, Calif., earth landing subsystem.

- end -



NASA
S-65-22784

Launch escape vehicle configuration